# Assessing Pension Investment Strategies in Today's Environment

November 12, 2021

ACTUARIES' CLUB OF BOSTON

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# Assessing Pension Investment Strategies in Today's Environment

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# Speakers


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# Agenda

- What's new in de-risking strategies?
  - Funding strategies and de-risking strategies
  - Case studies
- Emerging approaches in de-risking space
  - Diversification and derivatives
  - Case studies

# What's new in de-risking strategies?

Funding strategies and de-risking strategies
Case studies

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# Managing pension investment risks

- Asset allocation
- Liability driven investment (LDI )
- Glide path strategies
- Diversified portfolio and hedging strategies

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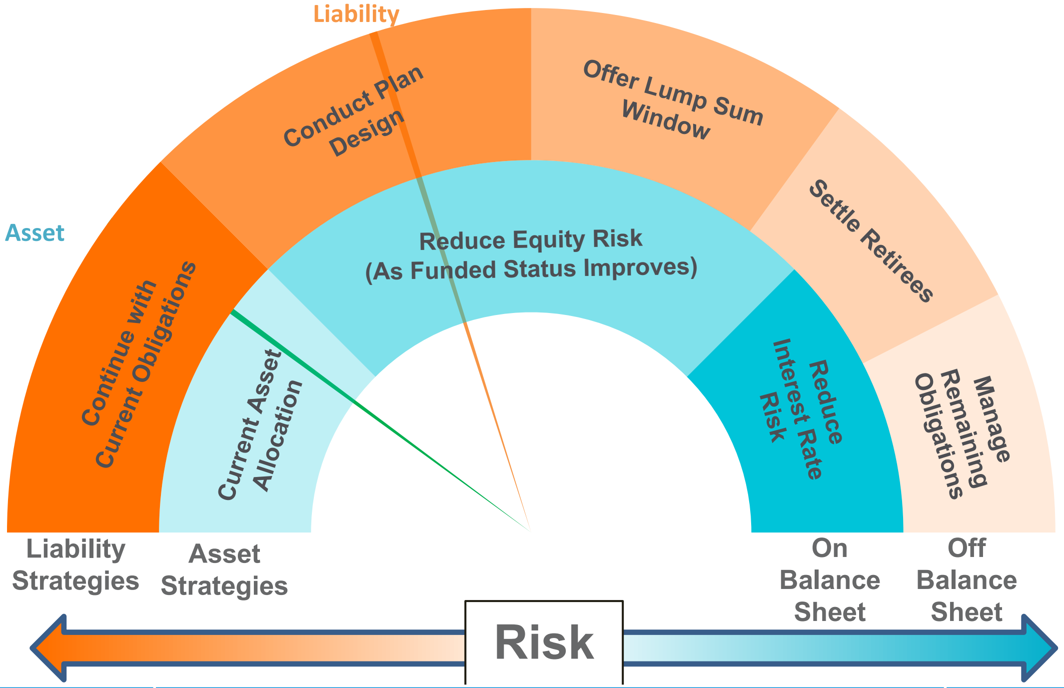
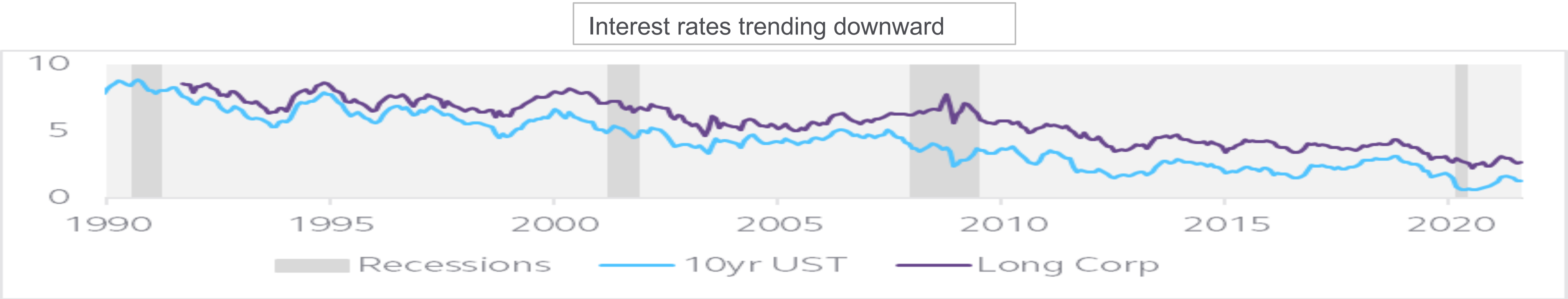
# Risk Management of a Pension Plan




**Ways to Move the Dial:**

| Gradual Approach | Moderate Approach | Aggressive Approach |
|---|---|---|
| 1. Continue Contribution Strategy | 1. Configure Expedited Contribution | 1. Large Contribution to Achieve 100% Funded |
| 2. Implement Glide Path | 2. Implement Glide Path and LDI | 2. LDI and Asset-in-kind (AIK) Strategy |
| 3. Put Plan into Hibernation | 3. Offer Lump Sum Window/Settle Retirees<br>4. Opportunistic Settlement | 3. Offer Lump Sum Window/Settle Retirees<br>4. Terminate Plan |

# Financial Crisis – Once In a Lifetime or Many?


Source: FactSet, NBER

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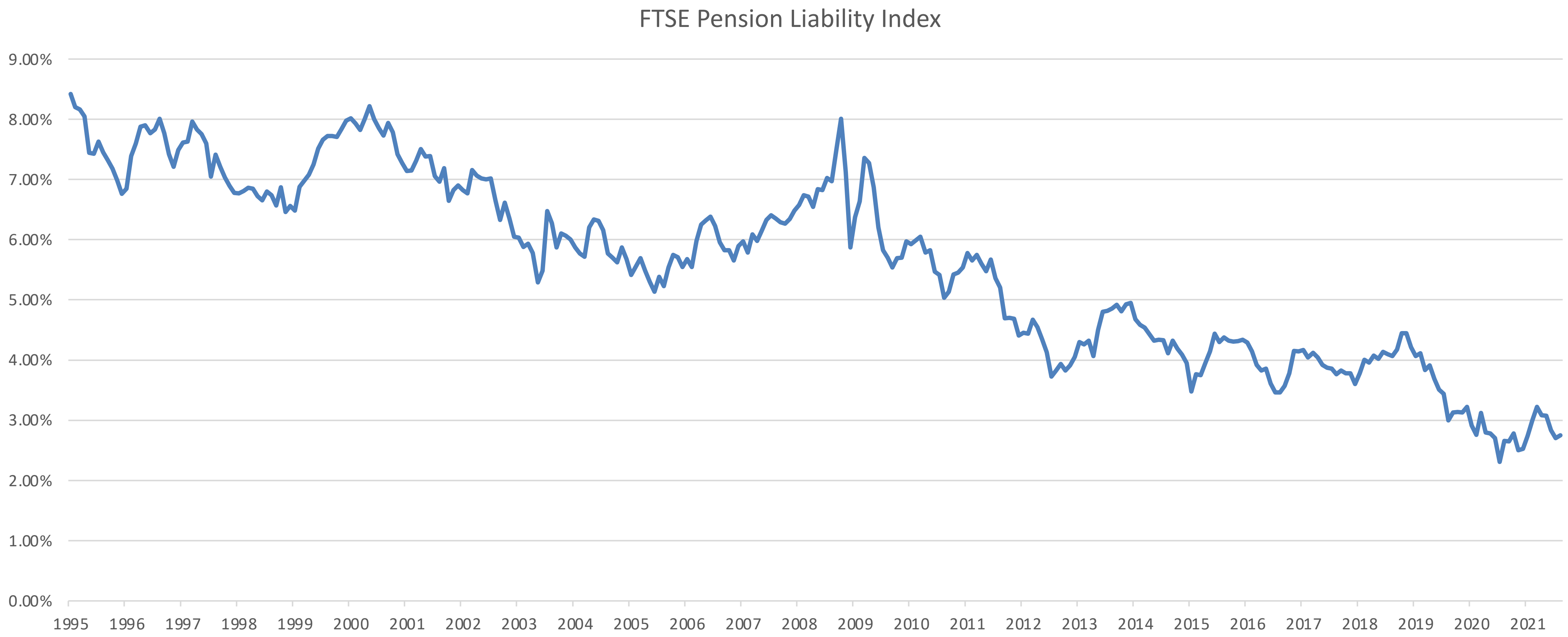
# Decline in Discount Rates



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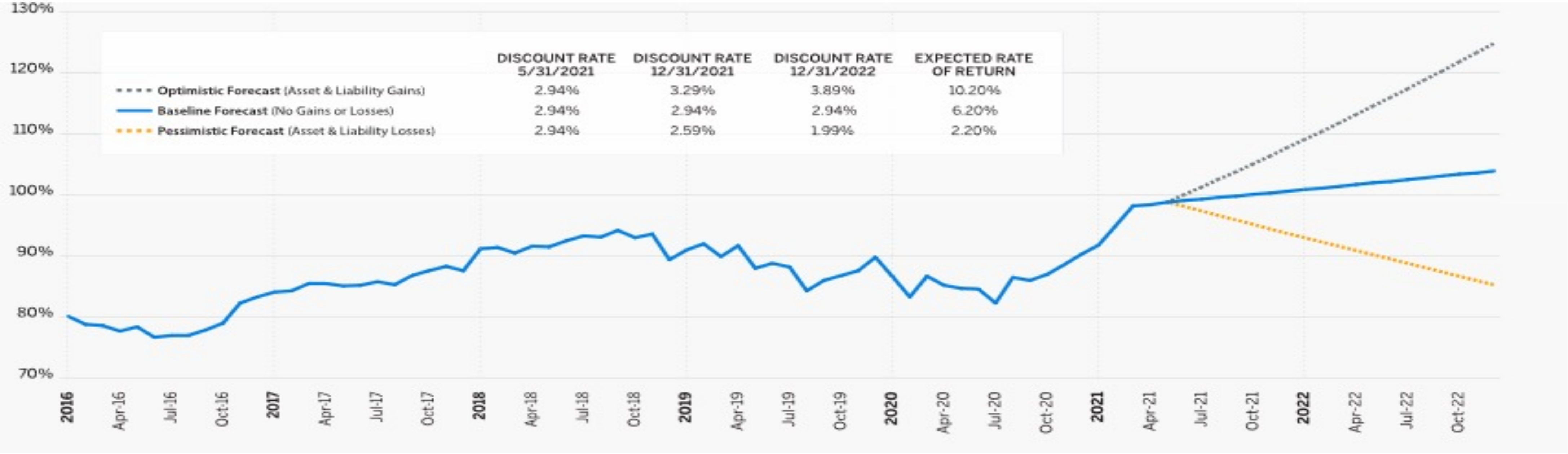
# Funded Status Improvement Lately




Milliman conducts an annual study of the 100 largest defined benefit pension plans sponsored by U.S. public companies. The Milliman 100 PFI projected benefit obligation (PBO) increased by $8 billion during May to $1.829 trillion. Over the last 12 months (June 2020 – May 2021), the cumulative asset gain for these pensions has been 15.3% and the Milliman 100 PFI funded status deficit has improved by $271 billion. The funded status gain is primarily the result of stellar investments over the past 12-month period. Discount rates declined through most of 2020 and only recently showed upward movements during the first quarter of 2021. The funded ratio of the Milliman 100 companies has increased significantly over the past 12 months, to 98.8% from 84.7%.

*Source: Milliman 100 monthly Pension Funding Index. The results of the Milliman 100 Pension Funding Index were based on the actual pension plan accounting information disclosed in the footnotes to the companies' annual reports for the 2020 fiscal year and for previous fiscal years. The Milliman 100 Pension Funding Index projects the funded status for pension plans included in their study, reflecting the impact of market returns and interest rate changes on pension funded status, utilizing the actual reported asset values, liabilities, and asset allocations of the companies' pension plans.

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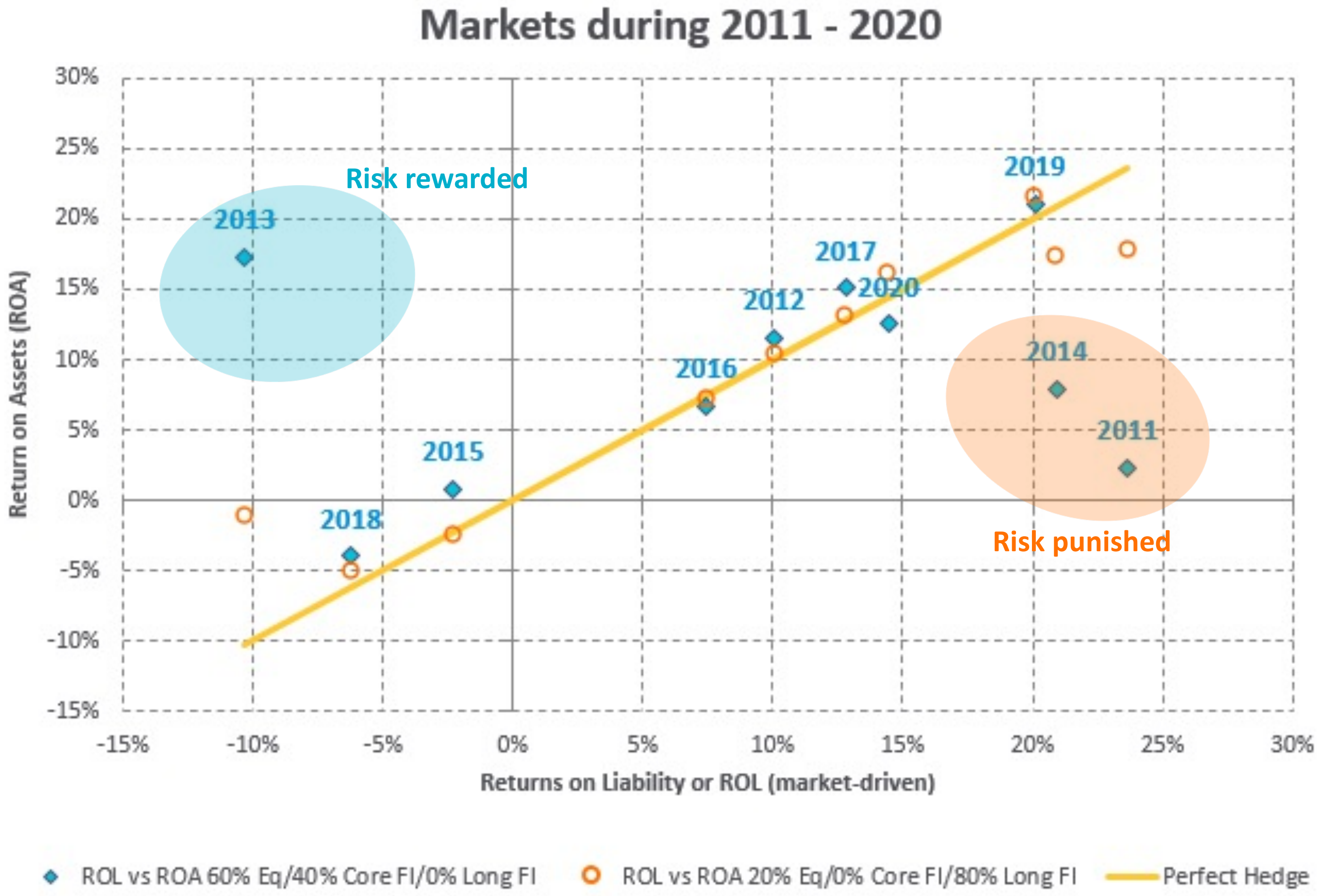
# Historical LDI Performance




The need to take risk for a frozen plan diminishes as funding ratio improves.

Investment focus moves from generating asset returns to hedging funded status downside risk.

Source: Principal Financial Group calculation. FactSet data.

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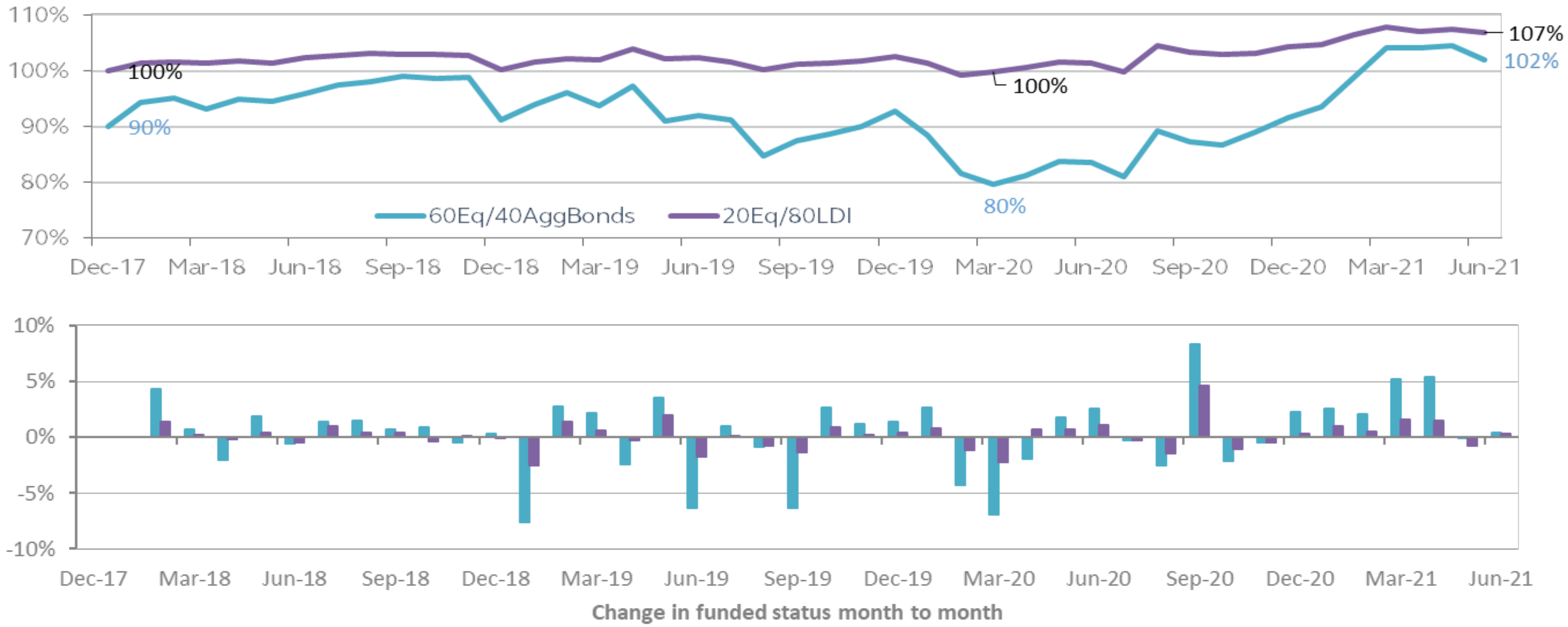
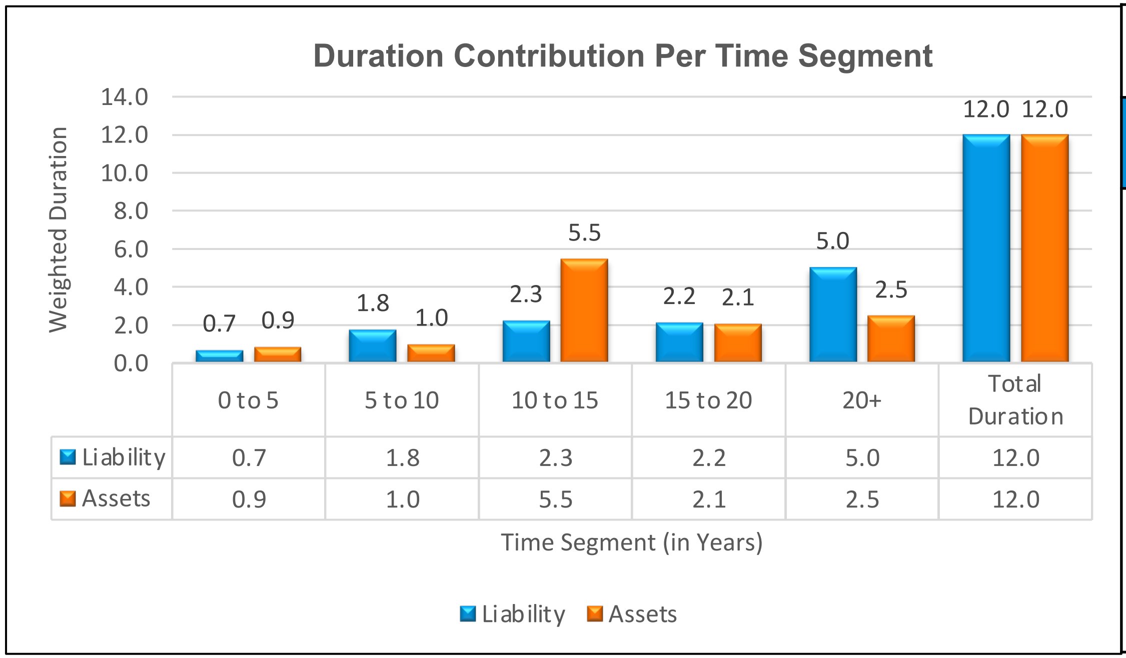
# Funded status for two allocations




Source: Principal Financial Group calculation. Sample plan liability with duration 16-18.

# Possible Fixed Income Strategy




**Sample Fixed Income Allocation – Duration Matched**

| Fixed Income Holdings | Assets | Duration | % of Holdings | Weighted Duration |
|---|---|---|---|---|
| Short Duration | $5,000,000 | 0.8 | 5.0% | 0.0 |
| Intermediate Duration | $25,000,000 | 5.6 | 25.0% | 1.4 |
| Long Duration | $60,000,000 | 13.5 | 60.0% | 8.1 |
| Extended Duration | $10,000,000 | 25.0 | 10.0% | 2.5 |
| **Fixed Income Portfolio** | **$100,000,000** | | **100.0%** | **12.0** |
| **Total Plan Portfolio** | **$100,000,000** | | **100.0%** | **12.0** |
| | | | **Liability** | **12.0** |

The duration target for the fixed income portfolio is ~11.70 overall. We are looking to avoid an over allocation to the long end of the curve (extended), while allowing for a large allocation to the 10-15 duration bucket. This provides exposure to long term investment grade corporate debt, the primary source of the plan's liability discount curve.

The duration target for the fixed income portfolio is 12.0 overall. The strategy is to best match the liability duration profile (11.70) using a segmented approach: short (1-3 duration), intermediate (5-7 duration), long (13-15 duration) and extended (20+ duration). An appropriate allocation mix among these segments is determined with the goal of matching duration and providing exposure along the yield curve. This allocation ratio is intended to remain static with increased overall portfolio duration matching achieved by an increased allocation to fixed income.

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# Case Study

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# What keeps CFOs awake at night

- Persistent low interest rates: lower interest rates meaning higher pension liability.
- If assets were not sufficient or didn’t keep up with higher liability, higher funded status (Assets *minus* Liability) gap and funded status volatility and pension expense.
- Directly affecting the balance sheet and P&L.
- Cost to carry pension obligations are also rising due to ever rising PBGC premiums and improvements in mortality in general.
- CFOs and CEOs are looking to manage risks in pension plans.

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# ARPA at a Glance

- Recently passed ARPA legislation provides a further extension of funding relief that has been available since 2012
  - Relief comes in the form of interest rate stabilization: interest rates used for minimum funding purposes being artificially held above the current low market interest rate environment
  - Relief also eliminates all existing 7-year amortization bases, and replaces with a 15-year base
- This legislation results in significant reduction in future required plan contributions
- Extends and enhances the existing funding relief
  - Current rates expected to drop from 90% of 25-year average in 2020 to 70% in 2024; ARPA increases rates to be 95% of 25-year average from 2020 through 2025
  - Creates a new 5.00% floor to 25-year average interest rates
  - Expected to reduces 2021 Funding Target Liability by 6% - 9%, with more significant impacts in later years
- Eliminates all existing 7-year amortization bases, and replaces with a 15-year base
  - This significantly reduces contributions, and make year-to-year changes less volatile

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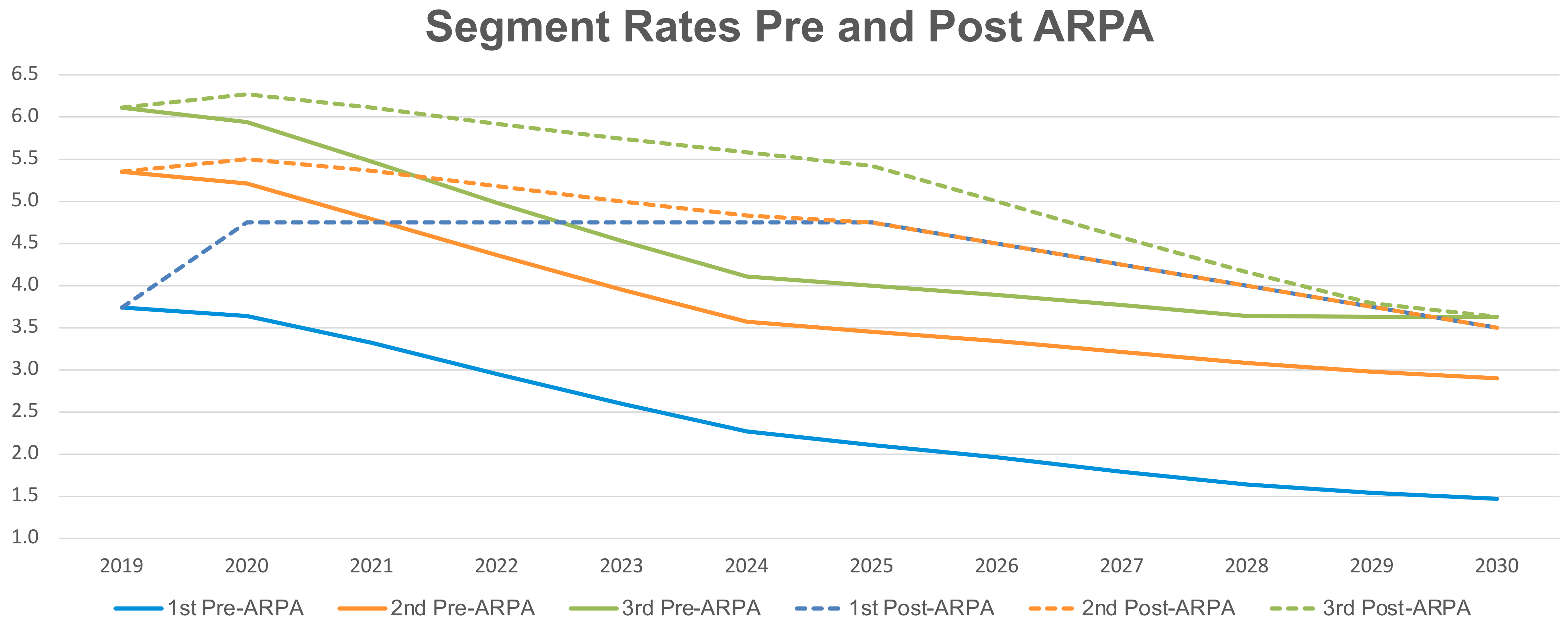
# ARPA Impact on Funding Interest Rates



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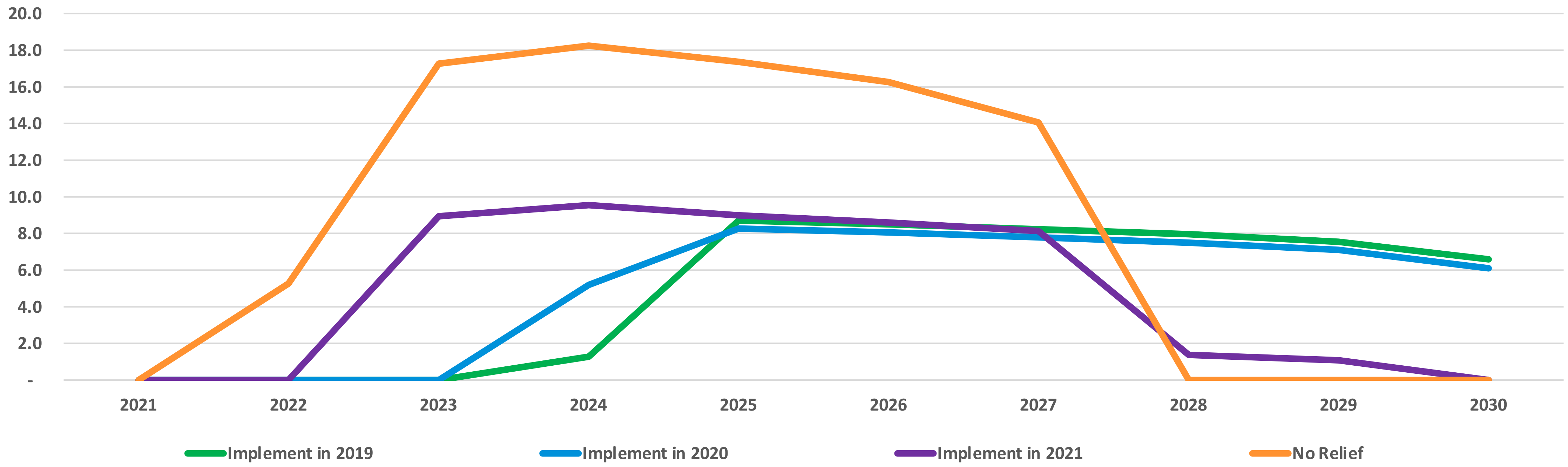
# Funding Relief Has a Significant Impact for Client
# Minimum Contribution with -10% Return in 2021; 6.75% Thereafter




| Minimum Contribution ($M) | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 | 2030 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Implement in 2019 | - | - | - | 1.3 | 8.7 | 8.5 | 8.2 | 8.0 | 7.6 | 6.6 | 48.8 |
| Implement in 2020 | - | - | - | 5.2 | 8.3 | 8.1 | 7.8 | 7.5 | 7.1 | 6.1 | 50.0 |
| Implement in 2021 | - | - | 9.0 | 9.5 | 9.0 | 8.6 | 8.1 | 1.4 | 1.1 | - | 46.7 |
| No Relief | - | 5.3 | 17.3 | 18.2 | 17.4 | 16.3 | 14.1 | - | - | - | 88.5 |

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# Glide Path Strategy

LDI "Liability Focused" Strategy - Glide Path Illustration

| Funded Status | ≤80% | <------80%-90%------> | | | | | | | <------90%-100%------> | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **EQUITY** | 70% / 30% | 65% / 35% | 60% / 40% | 55% / 45% | 50% / 50% | 45% / 55% | 40% / 60% | 35% / 65% | 30% / 70% | 20% / 80% | 10% / 90% |
| Large Cap Equity | **31.00%** | **28.00%** | **26.00%** | **24.00%** | **22.00%** | **21.00%** | **20.00%** | **17.00%** | **14.00%** | **8.00%** | **5.00%** |
| Growth | 10.00% | 9.00% | 8.00% | 8.00% | 7.00% | 7.00% | 6.50% | 5.50% | 4.50% | 2.50% | 1.50% |
| Core | 11.00% | 10.00% | 10.00% | 8.00% | 8.00% | 7.00% | 7.00% | 6.00% | 5.00% | 3.00% | 2.00% |
| Value | 10.00% | 9.00% | 8.00% | 8.00% | 7.00% | 7.00% | 6.50% | 5.50% | 4.50% | 2.50% | 1.50% |
| Mid Cap Equity | **7.00%** | **7.00%** | **7.00%** | **6.00%** | **6.00%** | **5.00%** | **4.00%** | **3.00%** | **3.00%** | **2.00%** | **0.00%** |
| Growth | 2.00% | 2.00% | 2.00% | 2.00% | 2.00% | 1.50% | 1.00% | 1.00% | 1.00% | 1.00% | 0.00% |
| Core | 3.00% | 3.00% | 3.00% | 2.00% | 2.00% | 2.00% | 2.00% | 1.00% | 1.00% | 0.00% | 0.00% |
| Value | 2.00% | 2.00% | 2.00% | 2.00% | 2.00% | 1.50% | 1.00% | 1.00% | 1.00% | 1.00% | 0.00% |
| Small Cap Equity | **7.00%** | **6.00%** | **5.00%** | **5.00%** | **4.00%** | **4.00%** | **3.00%** | **3.00%** | **2.00%** | **1.00%** | **1.00%** |
| Growth | 2.00% | 2.00% | 1.50% | 1.50% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% |
| Core | 3.00% | 2.00% | 2.00% | 2.00% | 2.00% | 2.00% | 1.00% | 1.00% | 0.00% | 0.00% | 0.00% |
| Value | 2.00% | 2.00% | 1.50% | 1.50% | 1.00% | 1.00% | 1.00% | 1.00% | 1.00% | 0.00% | 0.00% |
| International Equity | **19.00%** | **18.00%** | **16.00%** | **15.00%** | **13.00%** | **11.00%** | **9.00%** | **8.00%** | **7.00%** | **5.00%** | **3.00%** |
| Blend | 9.00% | 9.00% | 8.00% | 7.00% | 6.00% | 5.00% | 4.00% | 4.00% | 3.00% | 2.00% | 1.00% |
| Core | 10.00% | 9.00% | 8.00% | 8.00% | 7.00% | 6.00% | 5.00% | 4.00% | 4.00% | 3.00% | 2.00% |
| Emerging Mkt Equity | **3.00%** | **3.00%** | **3.00%** | **3.00%** | **3.00%** | **2.00%** | **2.00%** | **2.00%** | **2.00%** | **2.00%** | **1.00%** |
| REITS | **3.00%** | **3.00%** | **3.00%** | **2.00%** | **2.00%** | **2.00%** | **2.00%** | **2.00%** | **2.00%** | **2.00%** | **0.00%** |
| **FIXED INCOME** | | | | | | | | | | | |
| Short Duration | **1.50%** | **2.00%** | **2.00%** | **2.50%** | **2.50%** | **3.00%** | **3.00%** | **3.50%** | **3.50%** | **4.00%** | **4.50%** |
| Intermediate Duration | **7.50%** | **9.00%** | **10.00%** | **11.00%** | **12.50%** | **14.00%** | **15.00%** | **16.00%** | **17.50%** | **20.00%** | **22.50%** |
| Long Duration | **18.00%** | **21.00%** | **24.00%** | **27.00%** | **30.00%** | **33.00%** | **36.00%** | **39.00%** | **42.00%** | **48.00%** | **54.00%** |
| Extended Duration | **3.00%** | **3.00%** | **4.00%** | **4.50%** | **5.00%** | **5.00%** | **6.00%** | **6.50%** | **7.00%** | **8.00%** | **9.00%** |

Example for a plan with a dynamic glide path strategy in its investment policy statement.

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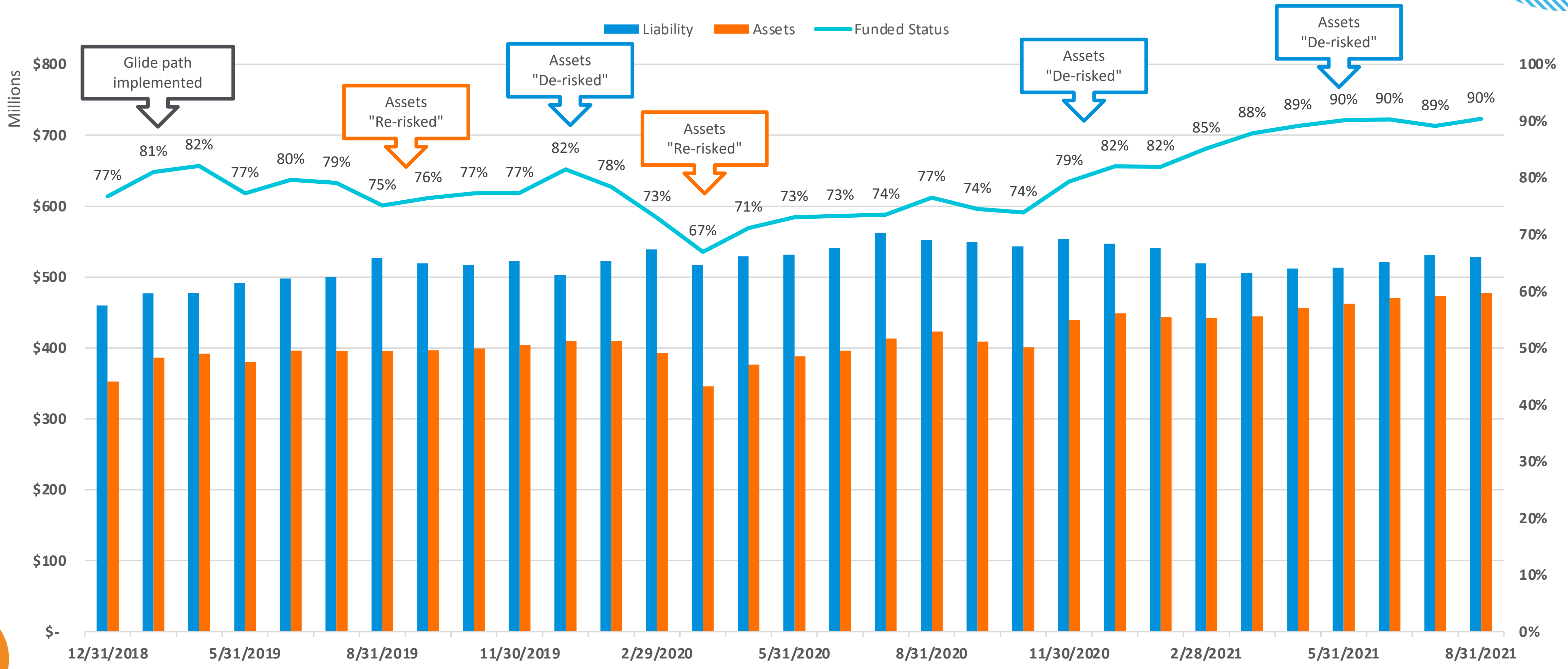
# Actions on Glide Path Strategy




Client de-risks on a monthly basis but re-risks only on a quarterly basis according to their glide path strategy

# Long Term Considerations for Plan Sponsor post-ARPA

- Time to revisit Benefits Strategy and HR goals?
  - Plan termination or hibernation?
  - Strategic Settlements?
    - Current funded status and less cash constraint may enable planned de-risking steps?
- Is reduction in contributions worth increase in PBGC premiums?
- Time to revisit funding and contribution strategies?
- Time to revisit Investment Strategies?
  - Desired investment returns/risk objectives?
  - More aggressive glide path/LDI towards full hedging?
  - Desired and controlled re-risking through derivatives?

# Emerging approaches in de-risking space
# - Diversification and derivatives
# - Case studies

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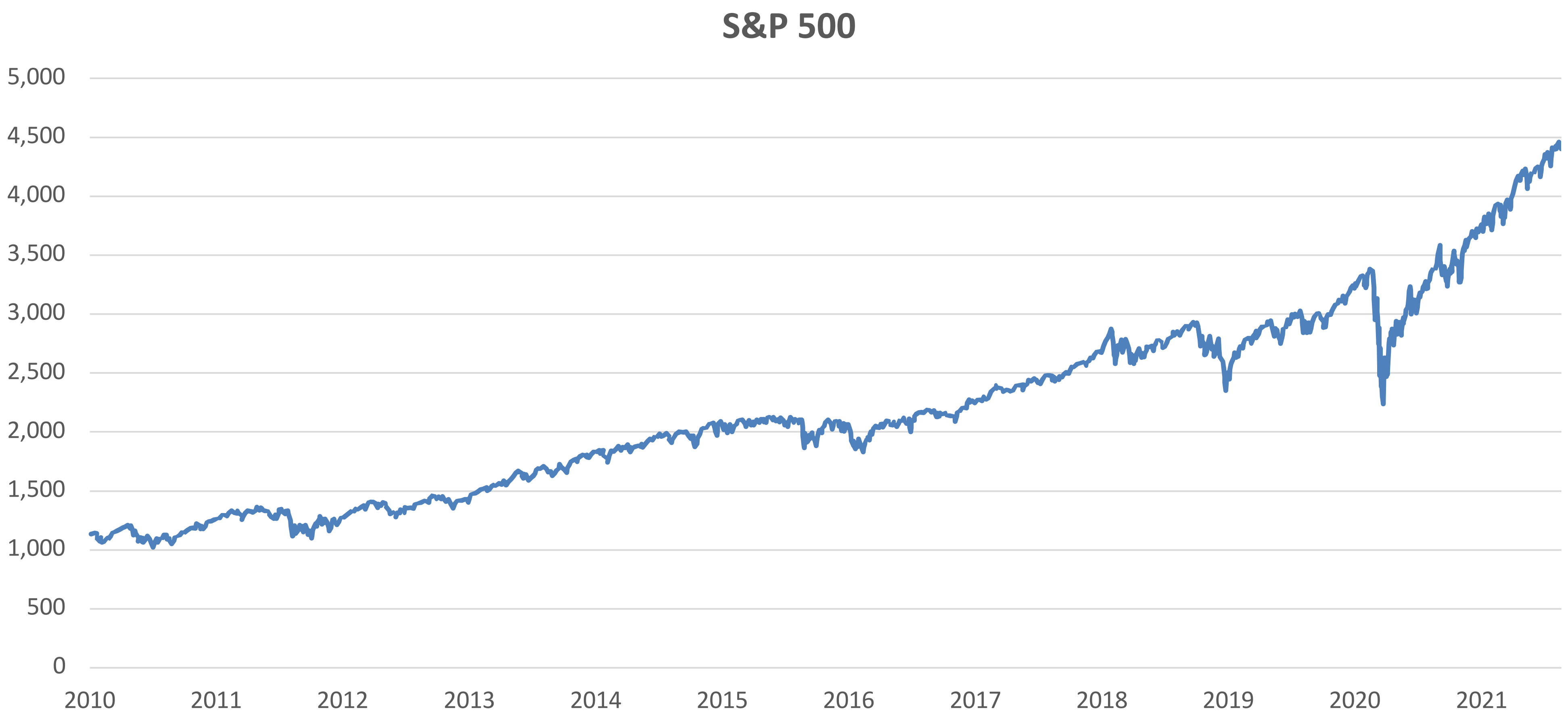
# Equity Market Expectations



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# Equity Market Expectations

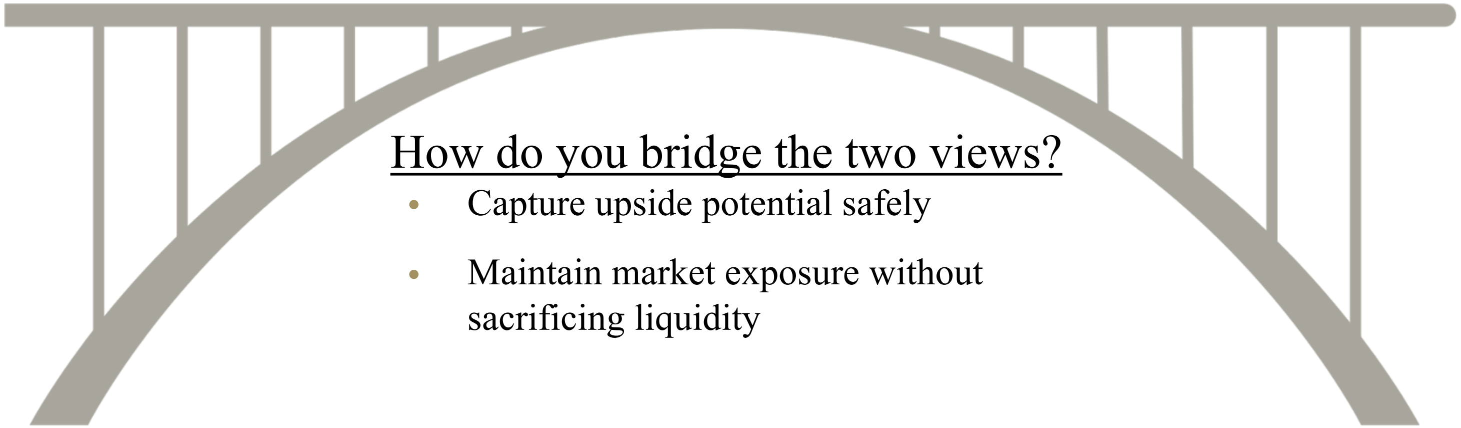
| | 2021 | 2020 | 2018 | 2016 | 2014 | 2012 |
|---|---|---|---|---|---|---|
| US Large Cap | 5.8% | 6.2% | 6.1% | 6.6% | 7.0% | 9.2% |
| US Small/Mid Cap | 6.3% | 6.9% | 6.6% | 7.0% | 7.4% | 10.0% |
| Non-US Developed | 6.4% | 6.8% | 6.7% | 7.1% | 7.4% | 9.5% |
| Non-US Emerging | 7.2% | 7.9% | 7.6% | 8.5% | 8.7% | 12.4% |

Average expected returns, all survey respondents, 10-year time horizon

Source: Horizon Actuarial Survey of Capital Market Assumptions

# Investment Strategy Views

| Short Term | Long Term |
|---|---|
| • Defensive to avoid losses | • Position for future growth opportunities |
| • Ensure sufficient liquidity for necessary drawdowns | • Less concerned about illiquidity (happy to take illiquidity premium) |
| • Rebalance to strategic allocations | • Risk managed through diversified portfolio |



How do you bridge the two views?

- Capture upside potential safely
- Maintain market exposure without sacrificing liquidity

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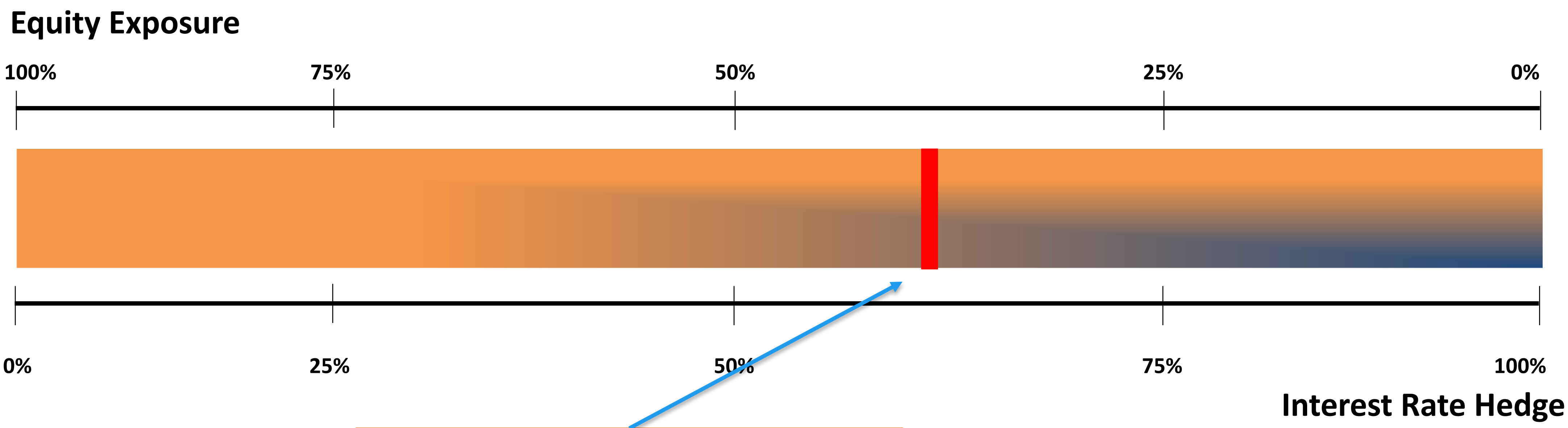
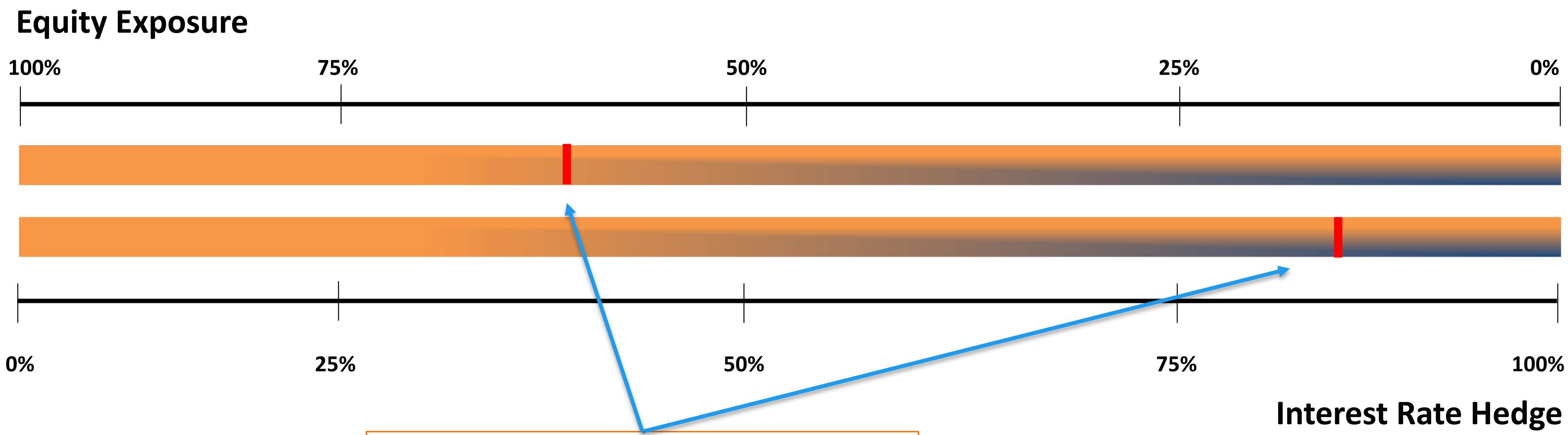
# Equity vs. Fixed Income Trade-Off




Traditional glidepath approaches force a trade-off between equity exposure and interest rate hedging

# Equity vs. Fixed Income Trade-Off




Using equity derivatives allows you to make decisions on equity exposure and interest rate hedging independently

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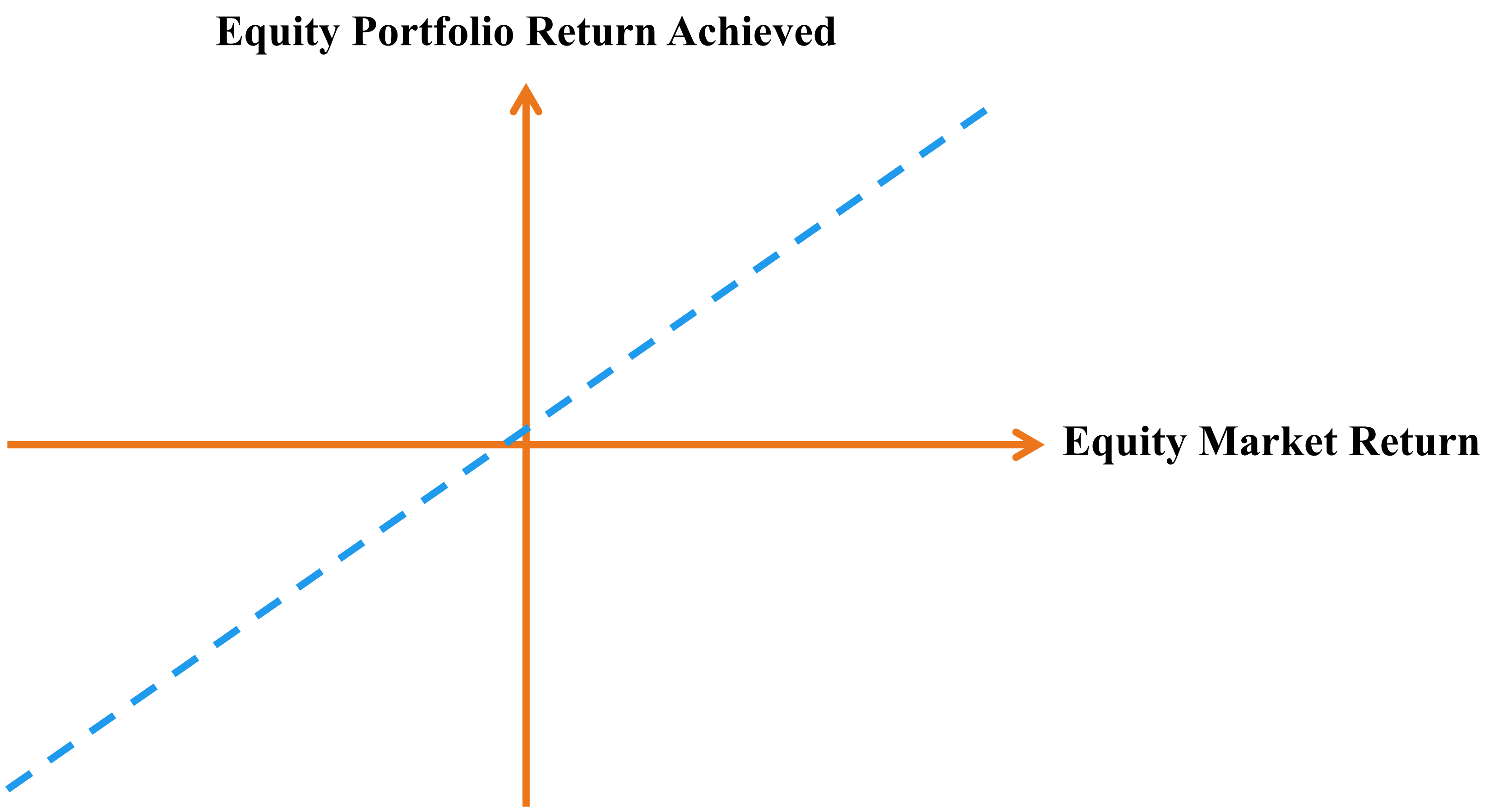
# Equity Derivative Illustration



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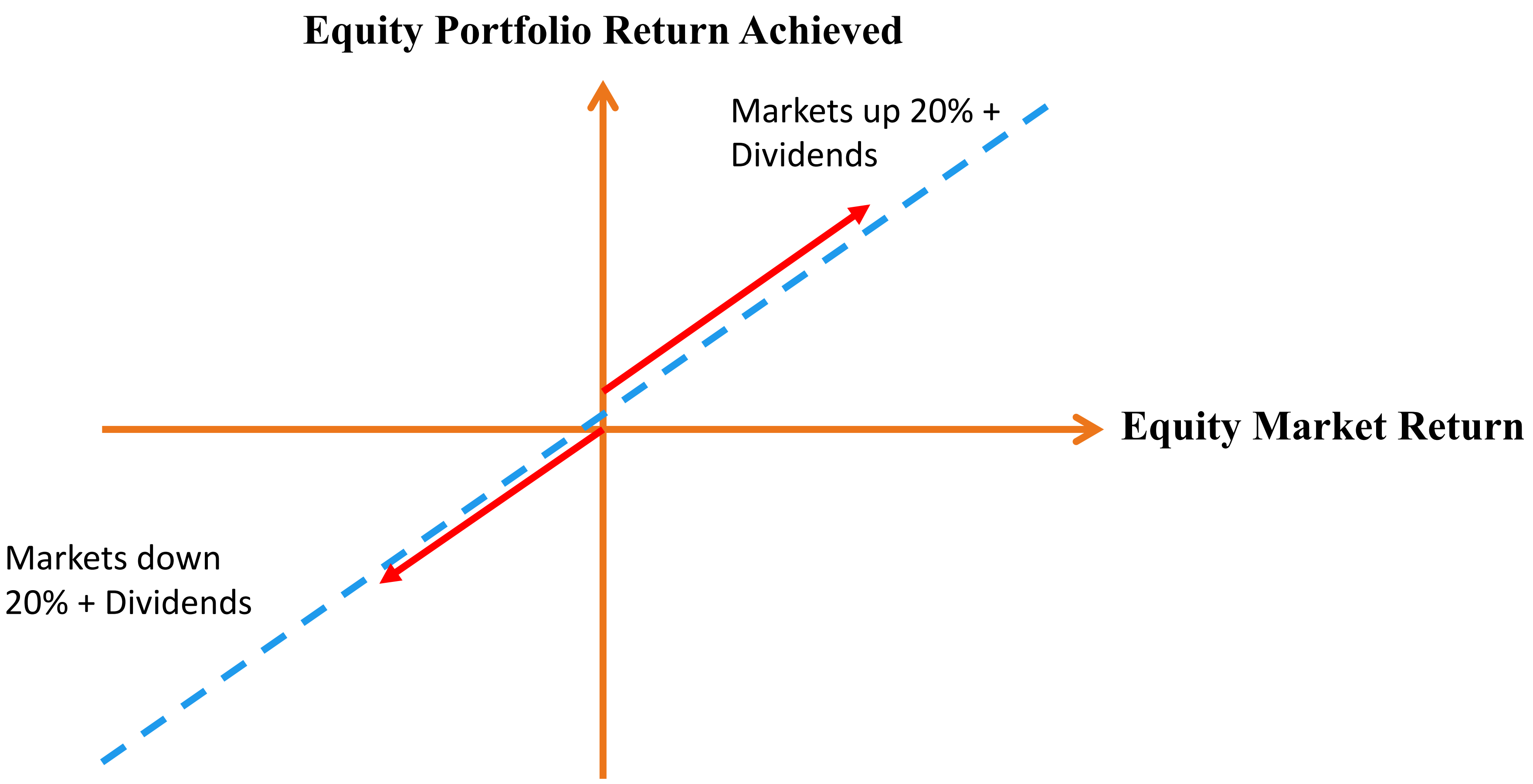
# Equity Derivative Illustration

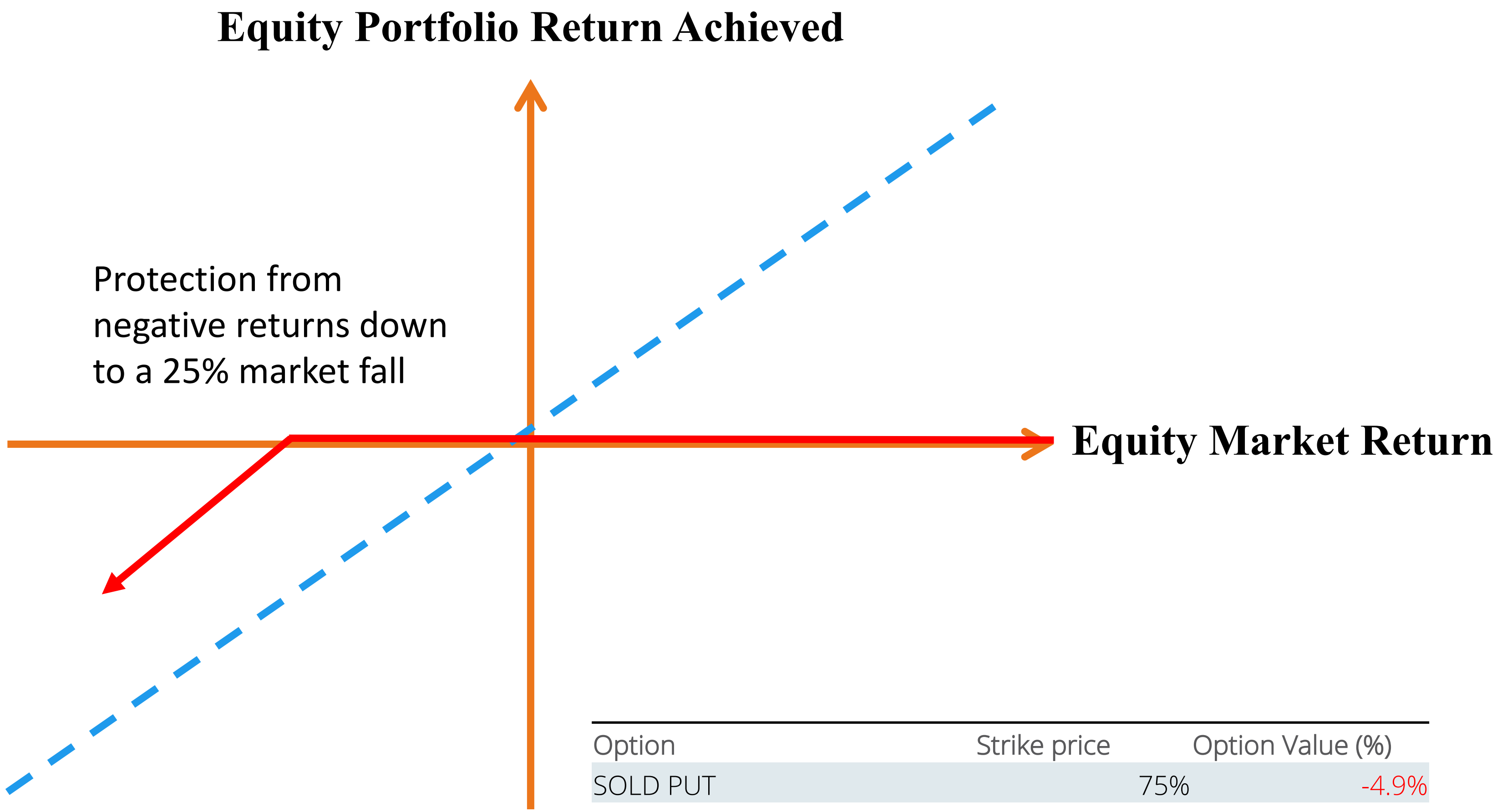


# Equity Derivative Illustration

Sell 3-year put option with strike at 75% of current market level.

Collect premium.

Pay counterparty if value of underlying is below 75% of initial market value at end of three years.



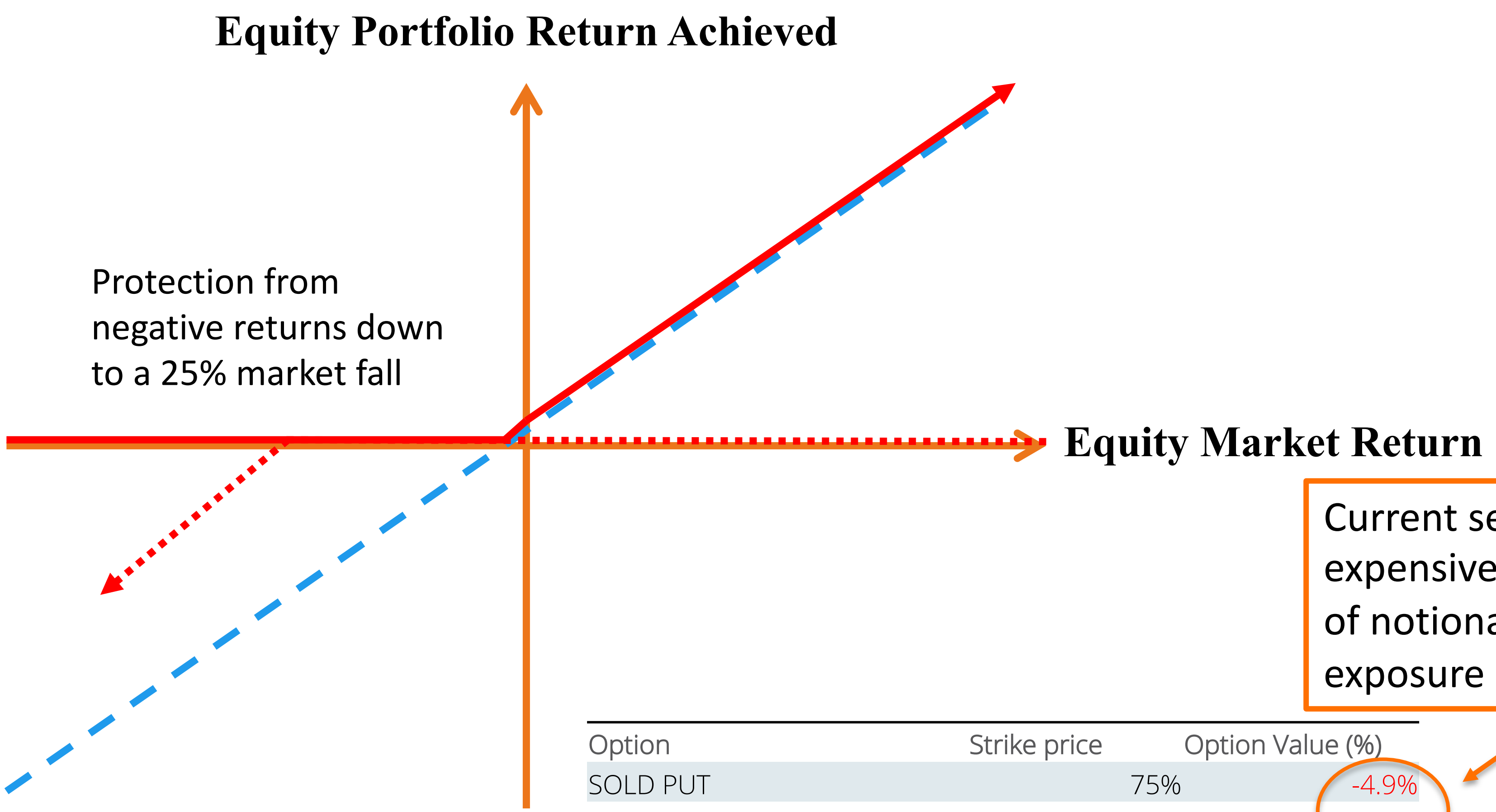

| Option | Strike price | Option Value (%) |
|---|---|---|
| SOLD PUT | 75% | -4.9% |

# Equity Derivative Illustration

Buy 3-year call option with strike at 96% of current market level.

Pay initial premium.

Receive from counterparty if underlying is more than 96% of initial value.




Current setup is expensive ~ 7.8% of notional exposure

| Option | Strike price | Option Value (%) |
|---|---|---|
| SOLD PUT | 75% | -4.9% |
| BOUGHT CALL | 96% | 12.7% |

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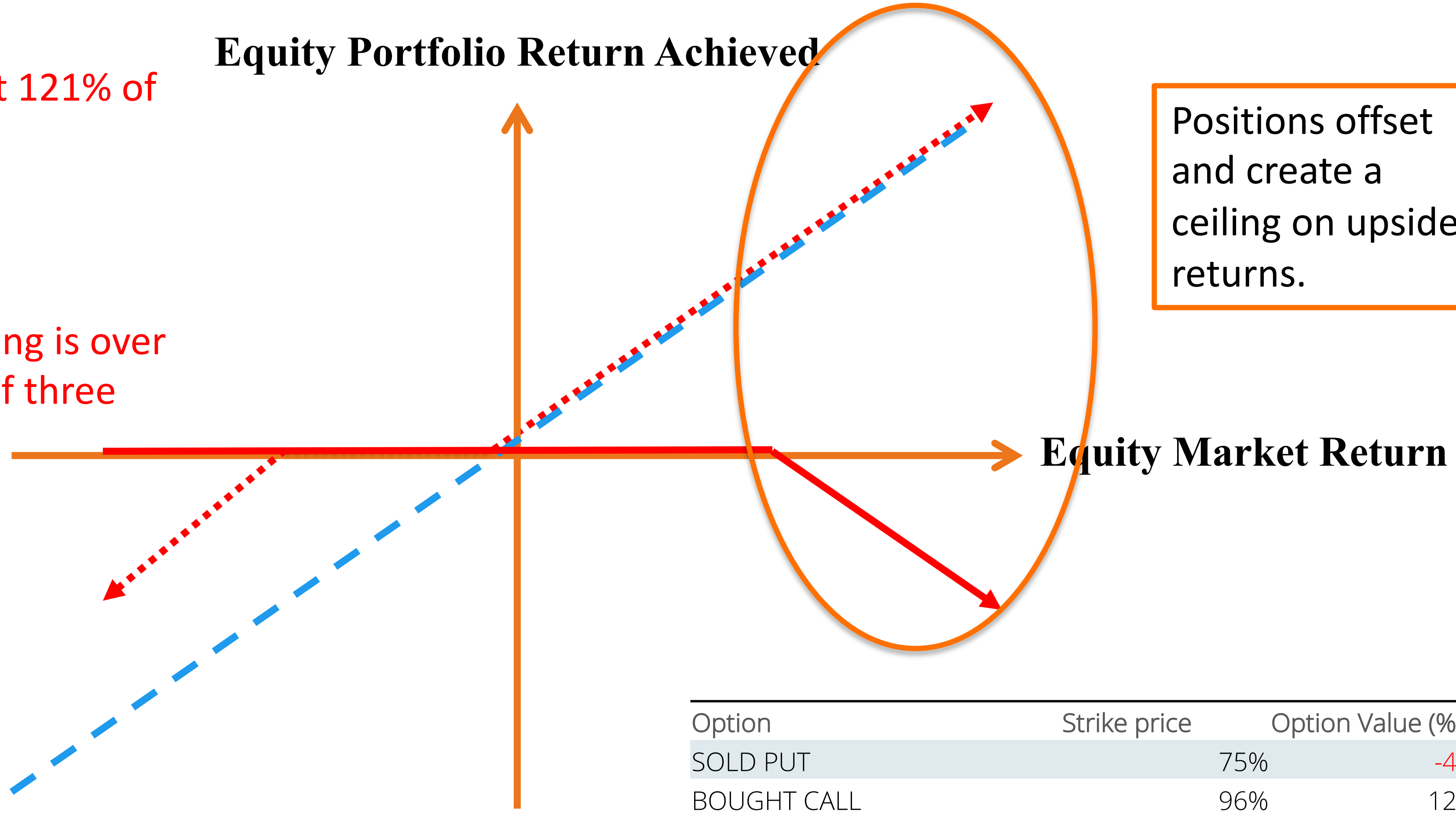
# Equity Derivative Illustration

Sell call option with strike at 121% of current market level.

Receive a premium.

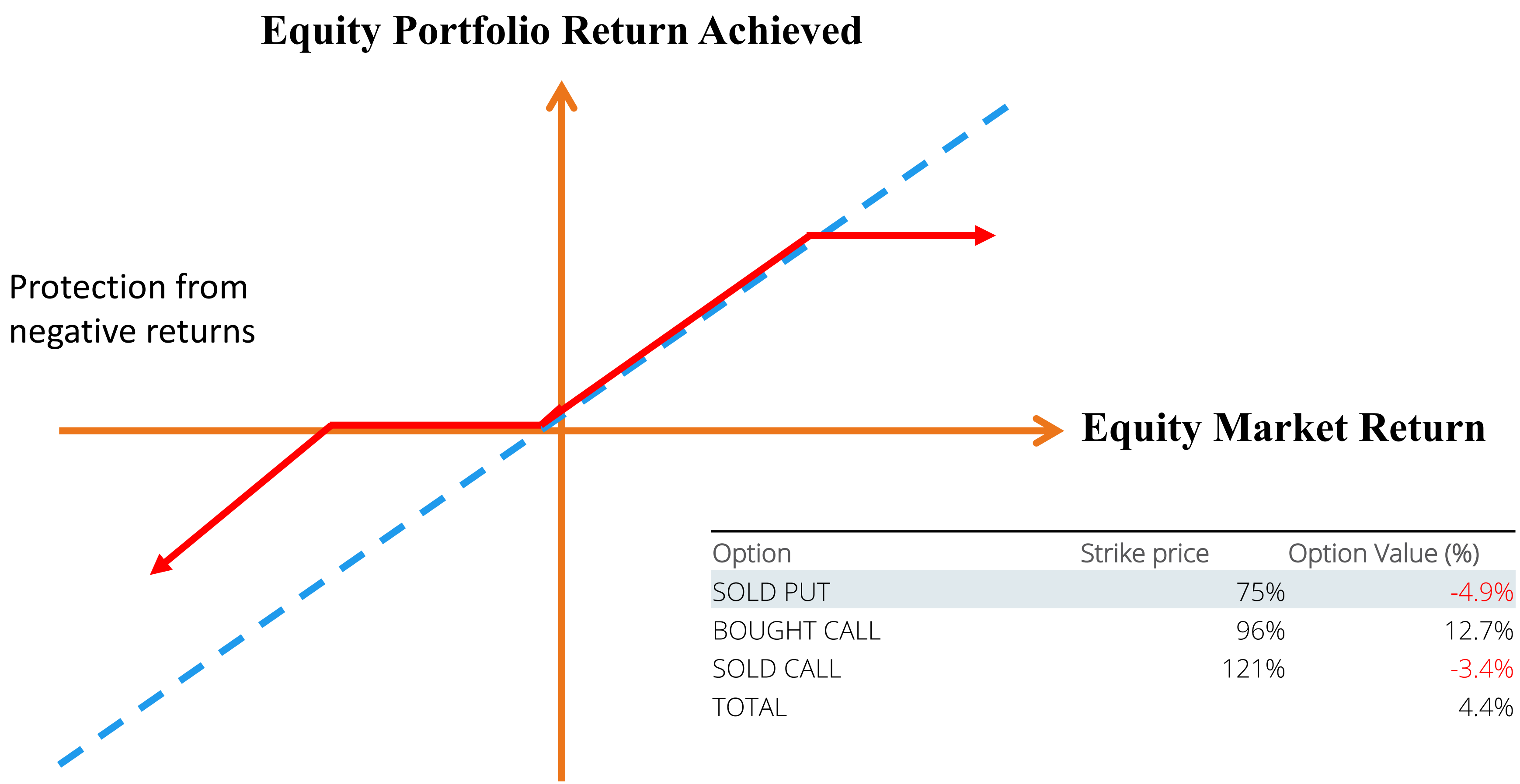
Pay counterparty if underlying is over 21% of initial value at end of three years.




Positions offset and create a ceiling on upside returns.

| Option | Strike price | Option Value (%) |
|---|---|---|
| SOLD PUT | 75% | -4.9% |
| BOUGHT CALL | 96% | 12.7% |
| SOLD CALL | 121% | -3.4% |

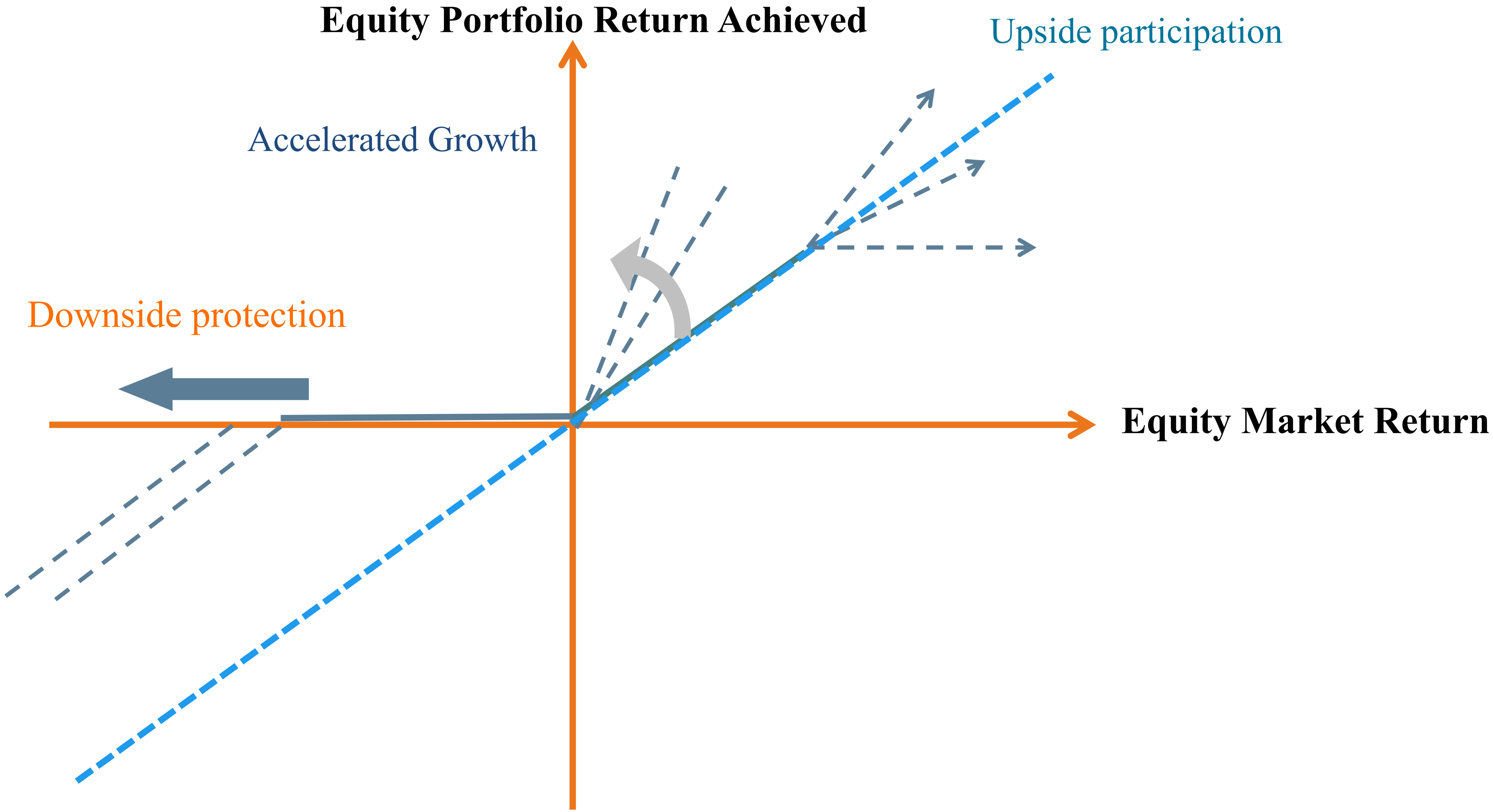
# Equity Derivative Illustration




| Option | Strike price | Option Value (%) |
|---|---|---|
| SOLD PUT | 75% | -4.9% |
| BOUGHT CALL | 96% | 12.7% |
| SOLD CALL | 121% | -3.4% |
| TOTAL | | 4.4% |

Example has upfront premium of 4.4%, similar to expected return over 3 years from additional bonds purchased if this is a replacement to conventional equities. Total return from strategy is capped at ~25% over 3 years, with protection down to a 25% fall in markets.

# Shaping Equity Returns



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# Basic Principles

Risk Management Needs

Investment Views

Time Horizon

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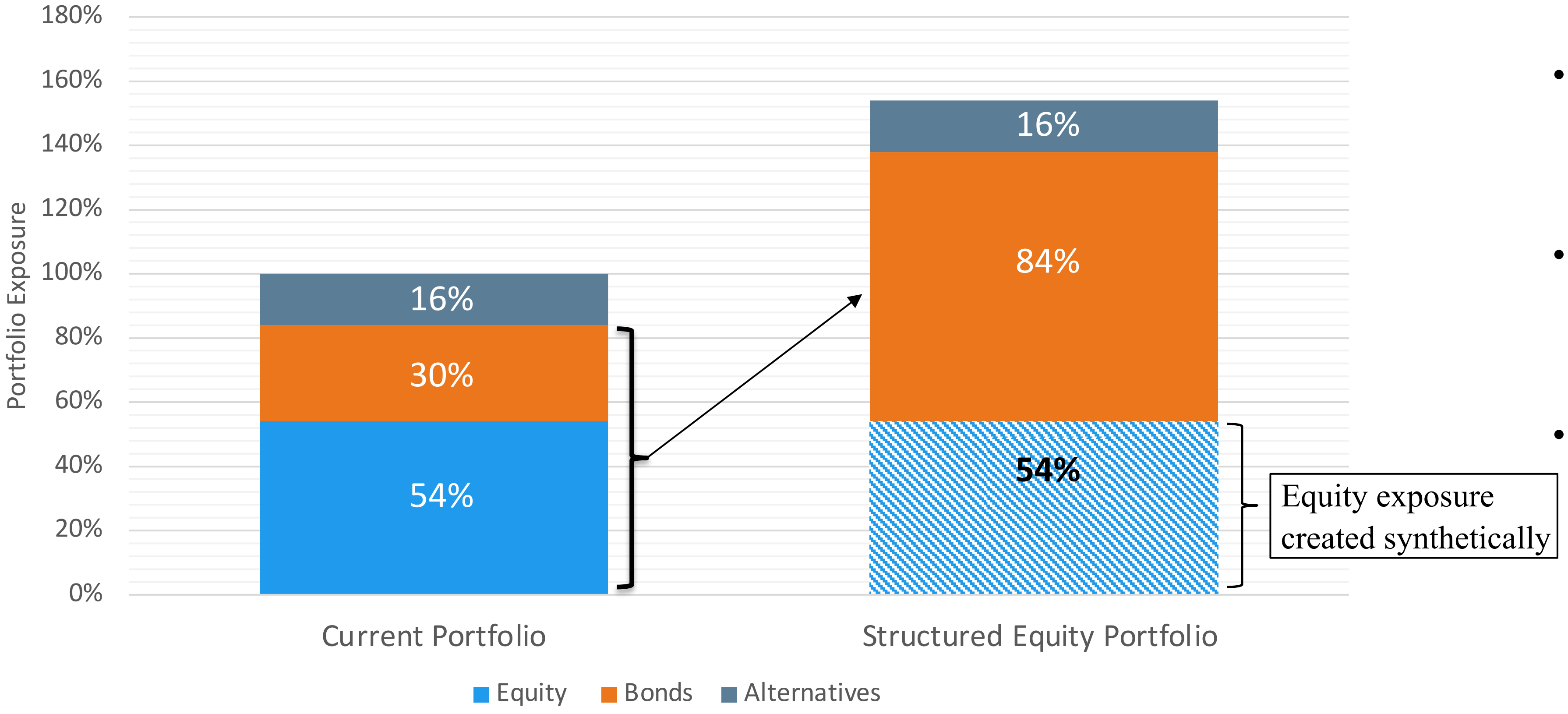
# Increasing the Size of the Portfolio




- Portfolio exposure doesn't have to equal physical asset exposure.
- Existing equities sold and bonds purchased with proceeds.
- Shaping equity exposure can allow company to incorporate market views and reduce equity risk

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# Simulated Example

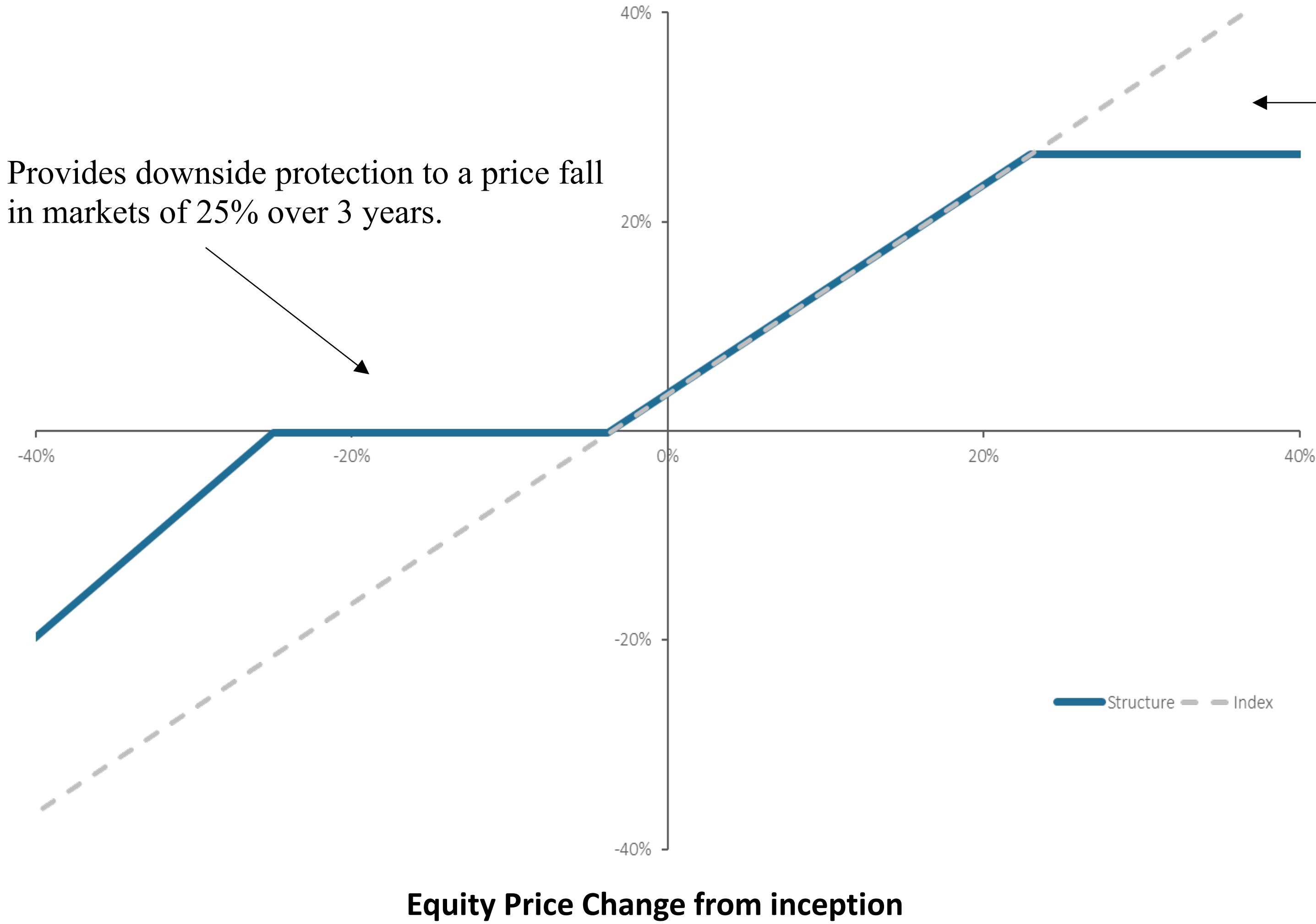
| Portfolio: | A. Current portfolio | B. Structured Equity + Bonds | C. Structure Equity + Long Bonds |
|---|---|---|---|
| **Market view best suited** | **Rising equities, rising rates** | **Uncertain equities, rising Rates** | **Uncertain equities, no rates view** |
| Equity % | 54% | 0% | 0% |
| Bonds % | 30% | 84% | 84% |
| Cash % | 4% | 4% | 4% |
| Diversified % | 12% | 12% | 12% |
| **TOTAL** | **100%** | **100%** | **100%** |
| Derivative type | n/a | structured equity | structured equity |
| Derivative notional (% of assets) | 0% | 54% | 54% |
| **TOTAL (including derivative exposure)** | **100%** | **155%** | **155%** |
| Total expected return | 5.5% | 5.8% | 6.3% |
| Interest rate hedge ratio | 11% | 31% | 61% |

Purposely done to keep expected returns broadly as current so focus is on volatility, can be increased or decreased if desired later

B. Same as current, but with equity derivatives + existing bond funds, replacing existing equity exposure

C. Same as B, but replace bond funds with longer duration liability matching bonds to increase interest rate hedge.

# Derivative Structure




| Equity Index Change | Return on Derivative over 3 years (%) |
|---|---|
| 30% | 25% |
| 20% | 23.7% |
| 10% | 13.6% |
| 0% | 6% |
| -10% | 0% |
| -20% | 0% |
| -30% | -6.7% |

*Derivative structure based on market conditions as at end July 2021. Total returns include yield from bonds, which are assumed to equal the initial premium of 3% of 3 years (1% pa)*

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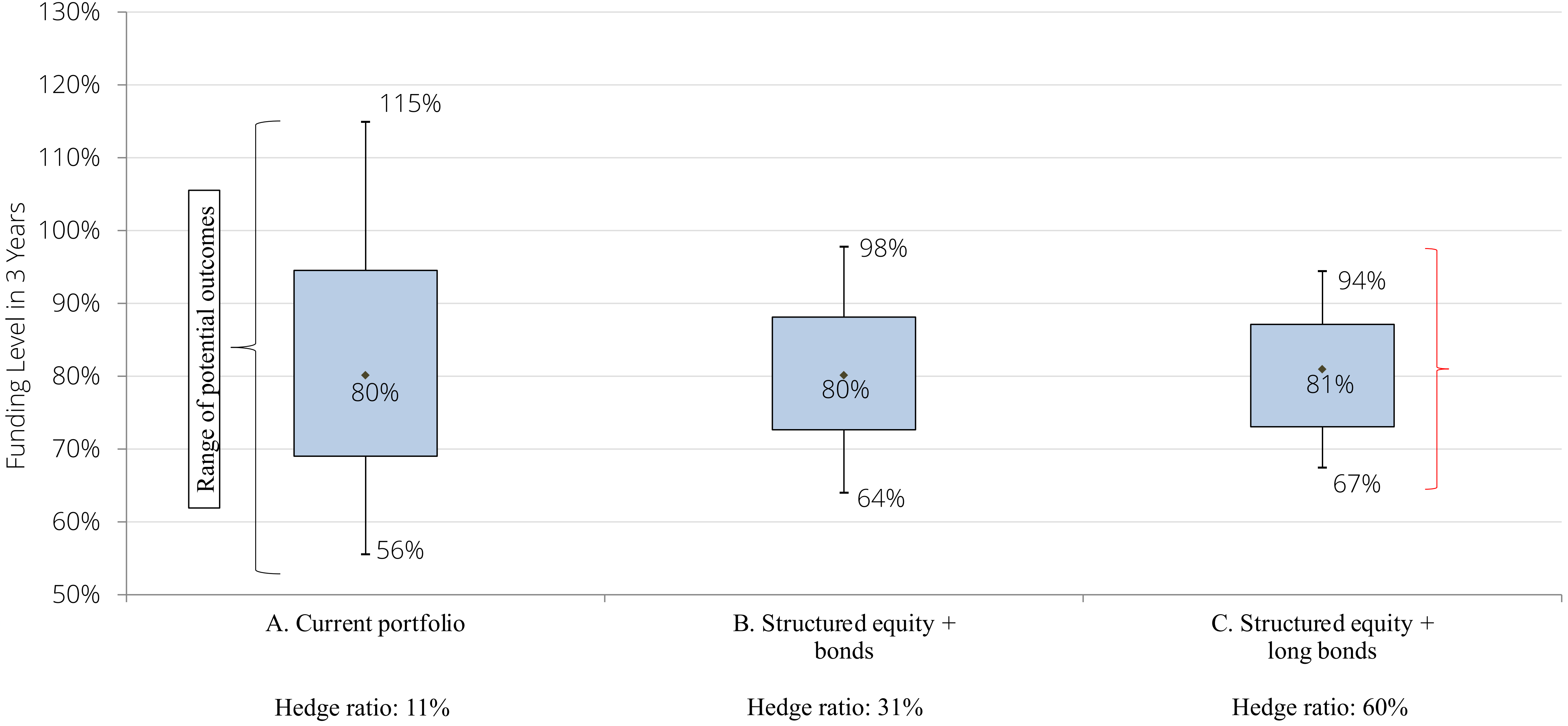
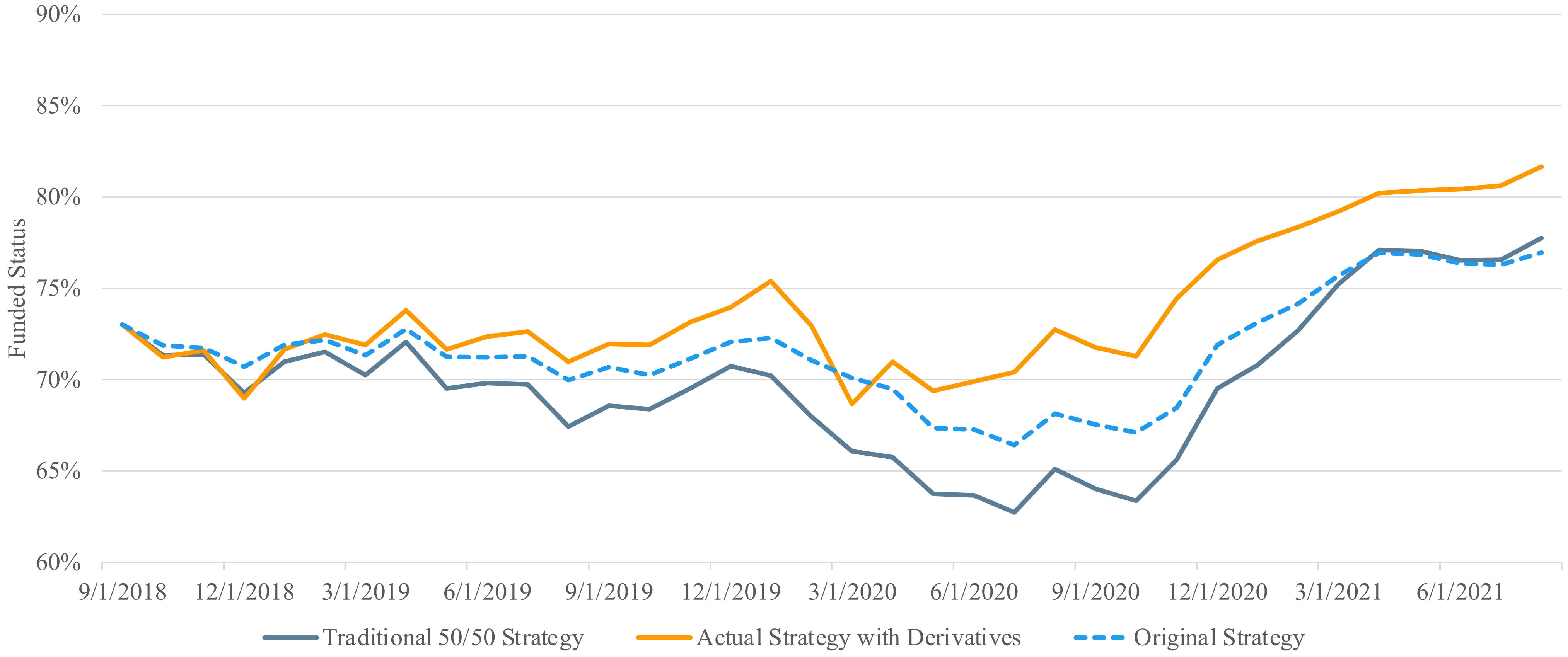
# Range of Funding Levels Over 3 Years



# Case Study




*Original Strategy was 72% Liability Matching, 28% Return Seeking prior to October 2018.*
*Actual investment strategy was 82% Liability, 18% Return Seeking, +41% Synthetic Equity from October 2018 to January 2020, and 100% Liability Matching + 50% Synthetic Equity from January 2020 to present.*
Actual strategy is compared against 50% Return Seeking, 50% Liability Matching, rebalanced monthly.

# Implementation

**Pension Plan**

**Derivatives Manager/Committee/Investment Consultant**
Investment Management Agreement / Investment Policy Statement

**Documentation**
- ISDA Documentation
- Credit Support Annex (CSA) Documentation

**KYC/Onboarding**

**Custody**

- Initial Setup: 2-3 months
- Ongoing changes can be implemented very quickly
- Structures can be designed to have $0 up front costs
- Ongoing costs:
  - Management fees
  - Trading costs – between equities and fixed income

CONFERENCE OF CONSULTING ACTUARIES

# Additional Considerations

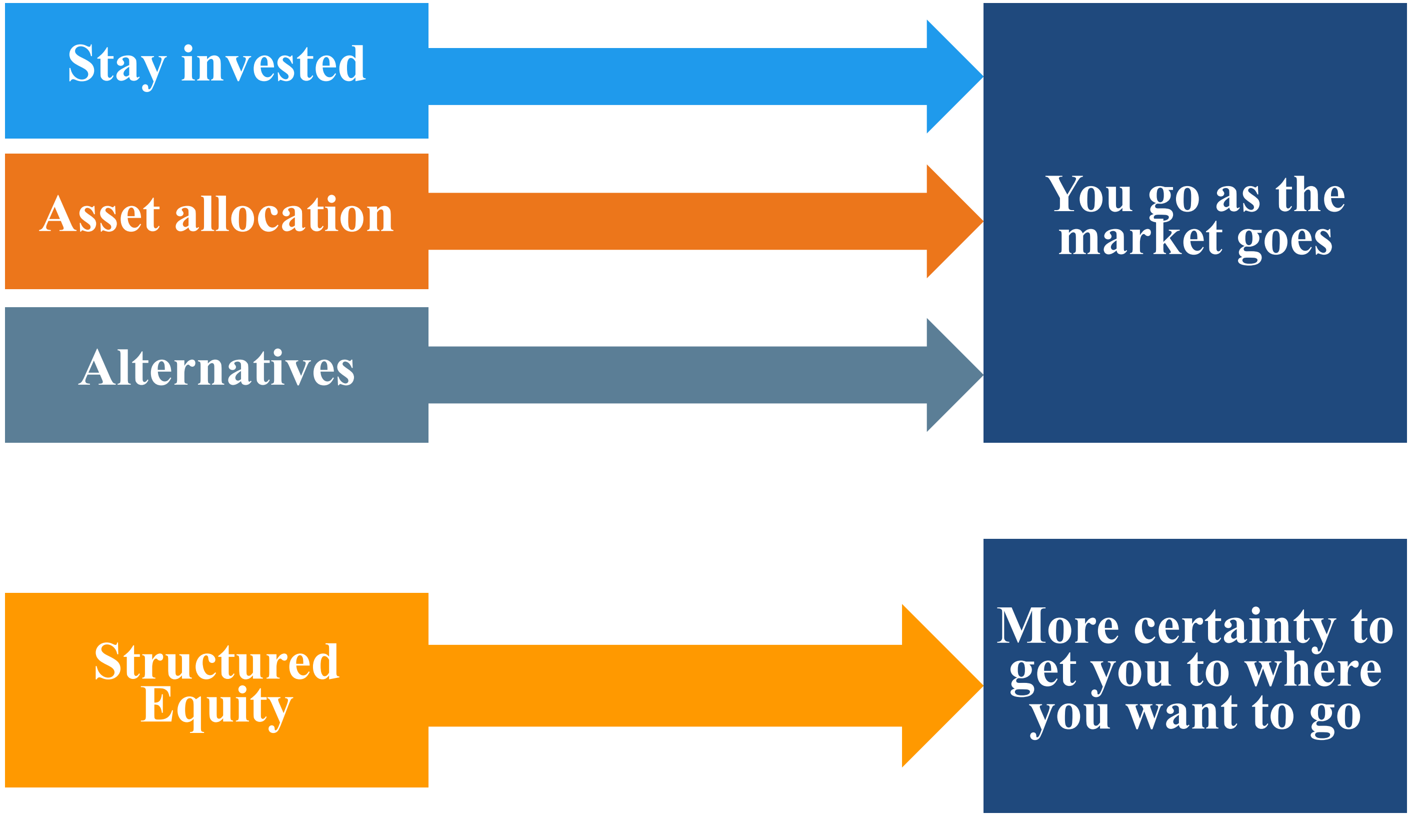
- Fixed Income Derivatives vs. Equity Derivatives
- Stay Invested in Down Markets
- Application to All Pension Plans (Public, Multiemployer, Church, High Deferral)
- Collecting a Premium with a Traditional Glidepath

CONFERENCE OF CONSULTING ACTUARIES

# FAQs

- What is the counterparty risk?
- How is collateral managed?
- Can structures be adjusted/terminated before expiry?

# Final Point


Stay invested
Asset allocation
Alternatives
You go as the market goes
Structured Equity
More certainty to get you to where you want to go

# Questions

## Assessing Pension Investment Strategies in Today's Environment

November 12, 2021

ACTUARIES' CLUB OF BOSTON

We believe this session qualifies for **0.5 hours of Core and 0.5 hours of Non-Core EA continuing education credit**

If seeking EA credit, **please send the following information** to president.actuariesboston@gmail.com

- Username you used to log into the webcast
- Whether you are currently engaged in substantive pension work
- An attestation that you were engaged in the session for the entire time period
- EA credit "key word"
- Whether you are requesting formal EA credit
- Contact info: name, email address, enrollment number
- A statement certifying the accuracy of all information and statements included in your email to the ACB

**Due date: November 19, 2021 (5:00 pm EST)**

## Assessing Pension Investment Strategies in Today's Environment

November 12, 2021

ACTUARIES' CLUB OF BOSTON

EA credit keyword

**FOOTBALL**